

Short Communication

Lost in Translation? Challenges and Opportunities for Raising Health and Safety Awareness among a Multinational Workforce in the United Arab Emirates

Tom LONEY¹, Robert Fletcher COOLING^{1,2} and Tar-Ching AW¹

¹Institute of Public Health, College of Medicine and Health Sciences, United Arab Emirates University, Al Ain,
²Parsons Brinckerhoff Middle East Limited, Dubai, United Arab Emirates

The United Arab Emirates (UAE) has experienced tremendous economic and industrial growth in the petroleum, airline, maritime and construction sectors, especially since the discovery of oil reserves. Mass recruitment of low skilled or unskilled laborers from less-developed countries has been utilized to satisfy the manpower demands of these fast paced industrial developments. Such workforce recruitment has created an unusual populace demographic, with the total UAE population estimated at 8.3 million, composed of 950,000 Emiratis, with the remainder being multinational expatriate workers, with varying educational qualifications, work experience, religious beliefs, cultural practices, and native languages. These unique characteristics pose a challenge for health and safety professionals tasked with ensuring the UAE workforce adheres to specific occupational health and safety procedures. The paper discusses two case studies that employ a novel multimedia approach to raising health and safety awareness among a multinational workforce.

Key Words: Occupational accidents, Occupational injuries, Safety management, Transients and migrants

The United Arab Emirates (UAE) is a rapidly developing country, composed of a federation of seven emirates (Abu Dhabi, Ajman, Dubai, Fujairah, Ras Al Khaimah, Sharjah and Umm al-Quwain), located in the southeast of the Arabian Peninsula. Although the UAE is a relatively new nation in the Middle East, it has witnessed tremendous economic growth over the past 40 years, especially in the petroleum, airline, maritime and construction industries [1]. In parallel with the economic and industrial developments, low skilled or unskilled laborers

are often recruited from less developed countries to satisfy the manpower demands of many projects, e.g., in the construction and service industries. Consequently, the UAE population has increased considerably since 1971 ($\approx 287,000$), with the predominantly urban population recently expanding from 4.1 million in 2005, to an estimated 8.3 million in 2010 [2], largely due to the high net inward migration of expatriate workers.

Workforce demographics

Expatriate workforce recruitment has created an unusual population composition, with the total UAE population comprising around 11% (950,000) Emiratis and the remainder being migrant workers from diverse socio-economic backgrounds [2]. The total population of the UAE's largest emirate, Abu Dhabi, is estimated to be 2.3 million, of whom over 50% are expatriate males aged 20-59 years [3]. Generally, there is a distinct

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Correspondence to: Tom LONEY
Institute of Public Health, College of Medicine and Health Sciences
United Arab Emirates University
PO Box 17666, Al Ain, United Arab Emirates
Tel: +971-3-713-7487, **Fax:** +971-3-767-2022
E-mail: tom.loney@uaeu.ac.ae

distribution of expatriate workers by nationality, with manual laborers predominantly from the Indian subcontinent, middle management from the Philippines and India, and senior management from the UAE, Europe, North America, and Australasia [2]. As such, there are numerous socio-cultural, religious, and educational differences between the various ethnic groups, which pose a unique challenge for occupational health and safety.

Morbidity and mortality of occupational injuries in the United Arab Emirates

Injury is the second leading cause of mortality in the UAE for all age groups, with occupational related fatalities attributable to 16% of all injury deaths in Abu Dhabi in 2007 [4]. Recent estimates suggest that the burden of morbidity related to work-related injuries is rising. The Health Authority Abu Dhabi (HAAD) reported that occupational injuries accounted for 22% of all injuries in the emirate of Abu Dhabi during 2010, including 101 fatal occupational-related incidents [3]. An analysis of surgical admissions from March 2003 to April 2005 at the main trauma hospital in Al Ain (the second largest city in the Emirate of Abu Dhabi, with a population of $\approx 450,000$ in 2005) showed 614 occupational injury hospitalizations during this time period, an incidence rate of 136 per 100,000 workers/year. Male migrant workers aged between 22 and 44 years (69%) originating from Pakistan (27%), India (24%), and Bangladesh (19%) accounted for the majority of incidents [5]. Over half of the occupational injuries were due to falls (51%), followed by falling objects (15%). The mean hospitalization duration was 9.4 days (standard deviation 11.8), with 36% hospitalized for > 1 week [5].

A separate study analyzing the trauma registry data from a large hospital in Al Ain for all admissions between March 2003 and March 2006, reported that foot injuries accounted for 7% of all admissions, and 61% of these foot injuries were work-related [6]. In agreement with the findings from the Barss et al. study [5], the most frequent mechanism of injury was a fall from a height (52%), followed by road traffic collisions (18%), heavy object trauma (13%), and falls not from a height (11%). Similarly, 98% of patients with a foot injury were males, and 74% were from the subcontinent of Asia, reflecting the workforce demographics from the region [6]. In summary, a large proportion of the UAE workforce is employed in potentially hazardous occupations (e.g., the construction industry); therefore, improving employee awareness of health and safety issues is vital to prevent the morbidity, mortality and economic losses associated with common workplace injuries resulting from falls and falling objects.

Challenges to improving health and safety awareness in the UAE

A lack of awareness regarding the risks associated with specific occupational activities, coupled with poor adherence to health and safety procedures, partly explains the high incidence of occupational-related injuries in the UAE. A recent study investigating the knowledge and practices related to occupational hazards among male cement workers ($n = 153$) in the Emirate of Ras Al Khaimah revealed that less than a third of workers reported using personal safety masks at all times during work [7]. Moreover, all cement workers reported that they had been provided with masks to protect them from dust; however, only 12% of workers reported that they were trained on how and when to use them. Similar studies conducted in the UAE have reported poor compliance with health and safety measures, including foundry, farm and cement factory workers failing to wear appropriate full-body, hand, foot, eye, ear and respiratory protection, resulting in impairments in visual acuity, hearing, lung function, and muscle function [8-12]. These studies identify a prevalent situation in the UAE, that expatriate workers either: (i) lack awareness of the negative health consequences of specific occupational hazards; and/or (ii) have not been trained in, or do not perceive the benefits of, adhering to specific health and safety requirements, such as the use of appropriate personal protective equipment. The findings also provide support to the view that in most occupational settings, personal protective equipment should be a measure of last resort in the hierarchy of control measures for workplace hazards. However, numerous employment sectors have occupations (e.g., agricultural workers, construction workers, firefighters, fishing-related workers, and miners) that require daily duties to be completed in inherently hazardous environments. Occupational safety training and education programs alone are not sufficient to protect workers from occupational hazards in these intrinsically hazardous employment settings. Rather, multiple levels of intervention are required to create a safe and productive work environment. These include enforcement of legislation and regulations, improved management accountability and safety supervision, and provision of adequate and appropriate engineering controls, educational programs, and personal protective equipment.

A further barrier to worker compliance with health and safety procedures is that a large proportion of expatriate workers from South Asia and the Middle East believe that the occurrence of life events has been predetermined [1], or is *naseeb* or *kismet* [13]; terms that refer to the religious faith that one's destiny has been preordained, or "written in advance" [14]. Workers with these beliefs are less likely to adhere to health

and safety procedures, or to take precautions when working in occupations with inherent hazards, such as the construction industry. Ensuring that workers comply with health and safety procedures, whilst remaining sensitive to their cultural and religious beliefs, can be challenging within certain sub-populations of the UAE workforce. The primary objective of health and safety awareness training is to positively influence the attitude of employees to recognize the importance of following standard procedures, and of utilizing available personal protective and safety equipment when required. Therefore, future health and safety awareness programs should employ a participatory design, whereby the target workforce plays an active role in the development of the program to ensure that the educational content complements the needs of the target group.

Health and safety legislation in the UAE

Raising employee awareness through the provision of information is one of the vital building blocks of effective health and safety management. All employees should be provided with the relevant information about the occupational hazards to which they may be exposed, and the precautions that their employers and themselves will need to take, to avoid or minimize the risks associated with workplace hazards. In the UAE, Federal Labor Law No. 8 1980 [15] and amendments (e.g., ministerial decree 32 of 1982 and 37/2 of 1982) are regulations aimed at promoting safety at work and preventing work-related injuries. Chapter 5 of the Labor Law outlines entitlements of workers, in terms of protective safety equipment, fire procedures, first-aid boxes, ventilation, sanitation, water and medical care. However, specific references to on-site safety and employee awareness training are absent, with only broad guidelines available. For example, Article 97 of the law states: “*The employer or his representative at the time of appointment must keep employees informed of the dangers related to their profession and preventive measures they have to take. Moreover, the employer must display detailed written instructions in this respect at places of business*” [15]. However, in relation to expatriate labor, the requirements for providing health and safety information contained in the UAE Labor Law 1980 [15] are not specific enough, and do not detail additional provisions for workers who do not speak Arabic, nor does the decree specify which format (e.g., verbal or written) the information should be provided in. These broad reference statements allow companies to interpret them as they deem appropriate, and written instructions in Arabic or English are of limited use for migrant workers exhibiting low levels of literacy. Therefore, important health and safety information should, where applicable, take into account employees’ language difficulties or disabilities, which may impede their understanding,

and ultimately their health and safety at work.

UAE labor law only refers to the ongoing maintenance or refreshment of health and safety awareness training in vocational training contracts or apprenticeships, e.g., Article 42 “*The employer shall give the trainee sufficient time for theoretical education and shall throughout the period fixed in the contract train him on the proper methods and skills of the vocation for which he is employed*” [15]. Finally, the regulation related to the qualifications and/or level of experience of the apprenticeship mentor is broad and indistinct “*the employer or any person giving the training must be adequately qualified and experienced in the vocation or trade in which the employee is to be trained*” [15]. Although there is currently a mismatch between industrial growth and the implementation of occupational health and safety legislation, the UAE government is investing significant resources in the progression of federal law that will cover all seven emirates, with the main objective of reducing the morbidity, mortality and economic losses associated with occupational injury [4]. In the emirate of Abu Dhabi, the present focus is on construction sites, where the majority of injuries are predominantly caused by falls from height or by falling objects, often due to a lack of basic health and safety awareness training. During the summer months, one of the priorities is preventing injuries and accidents associated with working in thermally stressful conditions (e.g., high ambient temperatures and humidity).

Case study 1: Safety in the heat - Prevention of heat-related illnesses

As the UAE labor force is composed of multinational workers with varying educational qualifications, work experience, religious beliefs, and cultural practices, the development of occupational health and safety education programs that cater for requirements in different languages and dialects is challenging. One flagship worker education program that has developed specific curricula to overcome these issues is HAAD’s ‘Safety in the Heat’ program. Heat-related illnesses are more likely to occur when individuals are exposed to hot conditions with high humidity, particularly when performing strenuous physical activity for extended periods. In 2010, the UAE Ministry of Labor estimated that over 50% of workers were employed in occupations (e.g., construction and agriculture) that required outdoor physical labor during the summer months [16]; these are typically characterized by ambient air temperatures exceeding 45 degrees Celsius, coupled with high humidity [17].

A large proportion of the UAE workforce is at risk during the summer months of developing heat-related illnesses that range from the mild (e.g., heat rash, heat syncope, and cramps), to the serious (e.g., heat exhaustion, heat injury, and heat

stroke). Over 3,000 cases of heat-related illness were treated in health-care facilities in the Abu Dhabi emirate during 2010, including one fatality [18]. However, the risk of serious heat illness can be markedly reduced by implementing a variety of preventive countermeasures, including monitoring environmental conditions, managing heat stress exposure, and maintaining adequate hydration. The 'Safety in the Heat' program was launched in May 2009 in the Emirate of Abu Dhabi [17], and initially reached more than 800,000 heat-exposed workers, at 465 companies across 6,254 work and labor residences.

The primary objective of the Safety in the Heat program was to reduce the incidence of heat-related illness and injury among at-risk workers by raising awareness and increasing knowledge of the health and safety issues related to occupational heat exposure. The target occupational groups were health and safety personnel, employees, and supervisors working in thermally stressful conditions, and middle management, senior management and managing directors or chief executive officers of companies with employees exposed to heat stress. Due to the diverse ethnic and cultural backgrounds of the UAE construction workforce, the Safety in the Heat program produced multimedia educational materials (Table 1), such as posters, leaflets and animated videos, in five different languages (English, Arabic, Hindi, Urdu, and Malayalam), and focused

on raising awareness of the dangers of heat exposure, and educating workers to monitor their personal hydration levels using their urine color as a simple indicator of hydration status [17]. A further component of the Safety in the Heat program was the development of a new heat stress index, called the Thermal Work Limit, which was validated for Gulf environmental conditions, to provide a maximum safe work rate for employees exposed to thermally stressful conditions, such as high ambient temperatures coupled with high humidity [19]. Preliminary findings from the Safety in the Heat program report that there was a marked reduction in heat related illness over a period of 2 years (2008-2009) at 2 companies, one of which reported a combined 80% decrease in cases (15.3 vs. 1.16 cases per 1,000 workers), while the other experienced a 50% reduction in serious cases (0.08-0.04 cases per 100,000 work hours) [17]. Improved safety performance may be due to a range of factors, including increased health and safety awareness as a result of the multimedia multilingual education program, enhanced engineering and administrative controls, and stricter enforcement of regulations and procedures. Future analysis of longitudinal hospital admissions data for occupational heat-related illnesses is required to assess the efficacy of the Safety in the Heat program at a population level.

Table 1. Summary of the multimedia and multilingual approach of the Health Authority Abu Dhabi's Safety in the Heat program*

Multimedia component	Target group	Objective	Languages
Poster	Workers	Increase fluid consumption and salt intake, promote self-pacing of work and adequate rest	English, Arabic, Hindi, Urdu, Malayalam
Illustrated awareness pamphlet	Workers	Same as above. Promote self-monitoring of hydration status using urine color, and eating a well-balanced diet	English, Arabic, Hindi, Urdu, Malayalam
Awareness DVD	Workers	Improve general awareness of heat hazard, including the signs and symptoms of heat-related illnesses, prevention strategies and emergency measures	English, Arabic, Hindi, Urdu, Malayalam
Pamphlet	Supervisors	Same as above	English, Arabic, Hindi, Urdu, Malayalam
Technical toolbox [†]	Supervisors, HSE personnel	Enhance specific technical knowledge of environmental assessment, using thermal work limit heat stress index, and factors related to thermal stress and the development of heat-related illnesses	English, Arabic
Roll-up banner	Employers	Increase awareness of major issues related to heat stress	English, Arabic
Website	Employers, HSE personnel	Act as a data rich portal to downloadable resources	English, Arabic

*Information collected from reference [18].

[†]Included training and procedure manual, technical information sheets, and training and awareness DVD.

DVD: digital video disk, HSE: health, safety and environment personnel.

Case study 2: Height aware campaign - Prevention of falls and falling objects injuries

The Ministry of Labor estimated that 42% of the UAE workforce in 2010 was employed in the construction industry [17]. Working above-ground or at height was therefore a common requirement for many workers. In 2011, HAAD reported that injuries related to falls and falling objects were the largest cause of occupational injury in the emirate of Abu Dhabi, causing 48% of non-fatal and 64% of fatal occupational injuries. Barss and colleagues [5] confirmed the severity and long-term complications of occupational injuries due to falls from height. They reported that 15% of falls patients had spinal fractures, and at least 10% of such patients (representing 5% of all trauma hospitalizations) suffered potentially permanently disabling injuries. The high rates of morbidity and mortality related to working at heights in the UAE could be reduced, if workers complied with basic health and safety regulations and measures, including the strict use of fall arrest devices and barriers, coupled with mandatory application of high-quality and suitable scaffolding or work platforms. In an attempt to

reduce the burden of occupational injury caused by working at heights, HAAD launched the Height Aware program (www.haad-height.ae) in May 2012 [20]. The program intends to raise awareness of business owners, health and safety professionals and workers, of the hazards associated with working at height, and the correct preventive measures required to reduce fatal and non-fatal injuries from falls and falling objects.

Height Aware multimedia resources provided by HAAD included instructional posters, pamphlets and animated videos, with culturally appealing cartoon characters developed in several languages (e.g., English, Arabic, Bengali, Urdu, Hindi, Malayalam), with varying degrees of technical difficulty [20] (Table 2). The Height Aware campaign utilizes a “top-down” and “bottom-up” approach, by developing manuals for supervisors and employers with more detailed technical information about how to make worksites safer for employees working at height. Resources are also provided for workers with potentially lower literacy levels that incorporate additional pictorial content. It is intended that the dual-pronged approach of educating management and supervisors to ensure worksites adhere

Table 2. Summary of the multimedia and multilingual approach of the Health Authority Abu Dhabi's Height Aware program

Multimedia component	Target group	Objective	Languages
Poster	Workers	Increase general awareness of safe work at height (e.g., edge protection, exclusion zones, training, stable work platforms, PPE)	English, Arabic, Bengali, Hindi, Urdu, Malayalam
Illustrated awareness pamphlet	Workers	Same as above	English, Arabic, Bengali, Hindi, Urdu, Malayalam
Awareness comic	Workers	Same as above. Increase awareness of wearing safety harness, using fall arrest devices, edge protection and barriers, ensuring stable work platforms, and securing tools	English, Arabic, Bengali, Hindi, Urdu, Malayalam
Animated awareness video (10 minutes)	Workers	Same as above. Increase general awareness of prevention strategies and emergency rescue procedure	English, Arabic, Bengali, Hindi, Urdu, Malayalam
Animated training video (20 minutes)	HSE Personnel	Enhance specific technical knowledge of procedures for safe work at height, including risk assessment and the hierarchy of controls	English, Arabic
Procedure and training manual	HSE Personnel	Same as above. Enhance knowledge of Best Practice Guidelines for Working at Heights	English, Arabic
Box set*	HSE Personnel	Same as above	English, Arabic
Awareness pamphlet	Supervisors	Increase knowledge of planning, organizing and supervising safe work at height	English, Arabic
Bilingual roll-up banner	Employers	Increase awareness of major issues related to work at height	English/Arabic
Website	Employers, HSE Personnel	Act as a data rich portal to downloadable resources	English, Arabic

*Included training and procedures manual, DVD with eight animated videos (total duration 110 minutes), and CD with electronic copies of all resources.

PPE: personal protective equipment, HSE: health, safety and environment personnel, DVD: digital video disk, CD: compact disk.

to health and safety regulations, coupled with raising awareness among employees of the hazards associated with working at height, will prove effective in reducing morbidity and mortality associated with working at heights. To maximize the reach of the campaign, HAAD has ensured that all the resources are available free, in either electronic or print format [20].

Conclusion

Migrant workers are no different from other employees, in that they import their ideas, attitudes, experiences and beliefs into the workplace. The high incidence of occupational related injuries in the UAE can be partly explained by the recruitment of large numbers of expatriate workers for rapidly developing construction and industrial projects, which have outpaced the ability of education, health and labor ministries to implement adequate health and safety training awareness programs. Health and safety practitioners tasked with training a multinational workforce should consider involving the target population (i.e., migrant workers) in the development of health and safety information and training to ensure that the materials provided complement the educational background, and the language or dialect requirements of the workforce. In addition, worker involvement at the developmental stage of health and safety training can facilitate ownership and engagement of health and safety issues, and foster a suitable organizational culture. Health and safety behaviour, and the factors influencing human actions, are complex. Educational interventions alone are not sufficient to reduce the morbidity and mortality resulting from either heat stress exposure or working at height. Overall, a multi-pronged approach is required, encompassing health and safety educational programs tailored to the workforce, improved engineering and administrative controls, and stricter enforcement of federal and regional industry-specific legislation and regulations, in order to minimize the morbidity, mortality and economic losses caused by occupational injury in the UAE. The approach, described in this paper, is also relevant to other countries with similar age groups of heterogeneous expatriate workers, especially countries with fast growing economies, in the Middle East (e.g., Qatar) and Asia (e.g., Singapore). Future occupational health and safety programs in countries with a high proportion of migrant workers should consider adopting HAAD's practice of employing evidence-based initiatives, supported by educational material that takes into account the diverse ethnic and cultural characteristics of the workforce.

Conflict of Interest

No potential conflict of interest relevant to this article was reported.

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